Hironori DEGUCHI*: *Luisierella* (Pottiaceae, Musci), a moss genus with a disjunctive distribution in Neotropics and Japan**

出口博則*: *Luisierella* 属（センボンゴケ科，蘚類），新熱帯と日本に隔離分布

During a recent botanical foray on Mt. Yokogura (ca 800 m), 30 km west of Kochi City, I was accompanied by Mr. H. Harada who collected a single bryophyte specimen which consisted of a small amount of a blackish moss growing sparingly on dry limestone at higher elevations. Microscopic study of this specimen indicated that it was a pottiaceous moss, but at that time, it was impossible to assign it to a genus, since nothing matching it was included in the recent monographic study of the Japanese Pottiaceae by Saito (1975). Fortunately, this moss possesses a characteristic leaf-shape and highly distinctive laminal cells. I consulted several manuals and finally found in Fig. 166 of Crum & Anderson (1981) beautiful illustrations that corresponded very well to the moss from Mt. Yokogura. It is *Luisierell barbula* (Schwaegr.) Steere, which at present constitutes a monotypic genus and has hitherto been known to be confined to many localities of the Neotropics.

I compared the Japanese plants with materials from the Neotropics and confirmed its identity. I report here this interesting *Luisierella barbula* from Japan and present some miscellaneous notes on it.

Luisierella barbula (Schwaegr.) Steere, Bryologist **48**: 84 (1945); Welch, Bryologist **53**: 240 (1950); Schornherst, Bryologist **56**: 2 (1953); Whitehouse, Bryologist **57**: 61 (1954); Whitehouse & McAllister, Bryologist **57**: 82 (1954); Crum & Steere, Sc. Surv. Porto Rico Virgin Isl. **7**(4): 479 (1957); Welch & Crum, Bryologist **62**: 169 (1959); Crum & Anderson, Bryologist **63**: 39 (1960); Crum & Anderson, Bryologist **64**: 317 (1961); Reese & Pursell, Bryologist **66**: 209 (1963); Crum & Anderson, Moss. East. N. Am. **1**: 364 (1981); Redfearn, Bryologist **84**: 421 (1981); Reese, Moss. Gulf South 119 (1983). —*Gymnostomum barbula* Schwaegr., Sp. Musc. Suppl. **2**(2): 77, pl. 175 (1826). —*Hyophila*

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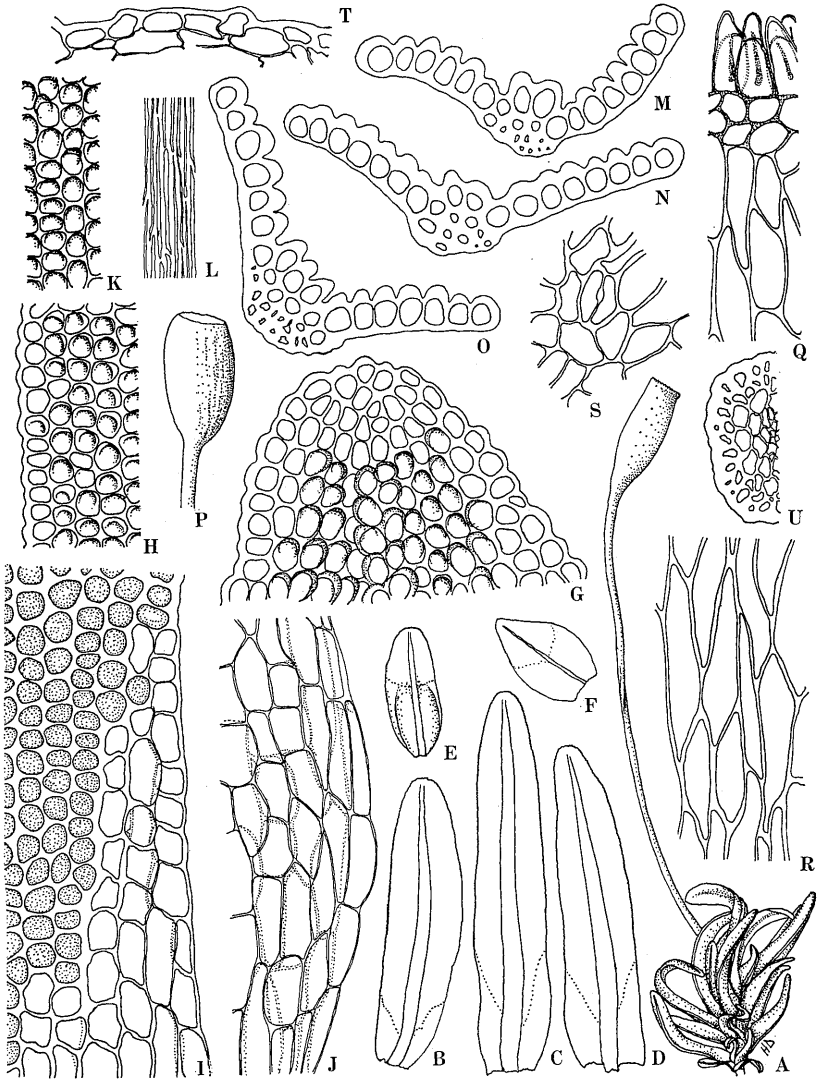
** Contributions to the moss flora of the Shikoku District (8).

barbula (Schwaegr.) Hampe, Bot. Zeit. **4**: 267 (1846). —*Pottia barbula* (Schwaegr.) C. Muell., Syn. **1**: 558 (1849). —*Weisia barbula* (Schwaegr.) Mitt., J. Linn. Soc. Bot. **12**: 136 (1869). —*Tortula melanocarpa* Mitt., J. Linn. Soc. Bot. **15**: 60 (1876). —*T. barbula* (Schwaegr.) Mitt., Rep. Sc. Res. Voyage Challenger, Bot. **1**(2): 91 (1885). —*Hymenostylium barbula* (Schwaegr.) Mitt., Rep. Voyage Challenger, Bot. **1**(1): 91 (1885). —*Gyroweisia cubensis* Broth. in Engler & Prantl, Nat. Pfl. **1**(3): 389 (1902), *nom. nud.*—*Gyroweisia barbula* (Schwaegr.) Par., Index Bryol. ed. 2, **2**: 29 (1904); Britton, Bryologist **22**: 87 (1919); Britton, Bryologist **24**: 17 (1921). —*Tuerckheimia barbula* (Schwaegr.) Hilp., Beih. Bot. Centralbl. **50**(2/3): 656 (1933). —*Luisierella pusilla* Thér. & P. de la Varde, Bull. Soc. Bot. France **83**: 74, figs. 1-20 (1930). =*fide* Steere, Bryologist **48**: 84 (1945). —*Luisierella stenocarpa* Biz. & Thér. in Thér., Mem. Soc. Cubana Hist. Nat. **13**: 273, pl. 34, figs. 4a-f (1939). =*fide* Steere, Bryologist **48**: 85 (1945). —*Desmatodon barbula* (Schwaegr.) Grout, Moss Fl. N. Amer. **2**(5): 271, pl. 114, figs. 12-20 (1940).

Plants dark-green to reddish- or blackish-brown, small, 1-1.5 mm high, forming thin tufts. Leaves weakly contorted when dry, erect-spreading when moist, lingulate with obtuse apex and slightly expanded base, 1.2-1.5 mm long and 0.3-0.35 mm wide, dilatated V-shaped in cross-section of leaf in which ventral free are walls crenulate from cell projections and dorsal free walls entire; lamina unistratose throughout; margins plane, crenulate by mamillose-papillose cells; costa vanishing a short distance below apex, ca 80 μm wide in the middle part of leaf, with mamillose-papillose, quadrate adaxial epidermal cells and non-papillose, linear abaxial epidermal cells; upper and middle laminal cells chlorophyllose, bulging ventrally, nearly homogeneous, 10-13(-15) μm wide, thick, brownish walls, rounded transversely rectangular to quadrate; chlorophyllose cells protruding along costa into hyaline basal part, in which cells are much inflated and thin-walled, while basal hyaline cells ascending up along the margins,

Fig. 1. *Luisierella barbula* (Schwaegr.) Steere A. Plant with sporophyte, ×20. B-D. Leaves, ×32. E-F. Perigonial laeves, ×32. G-J. Laminal cells from leaf-apex (G), middle part of leaf (H), transitional part between chlorophyllose part and basal hyaline part (I), and angular part (J), ×320. [G, H, J: view from ventral side; I: view from dorsal side, shaded cells indicating cholorophyllose cells, others hyaline cells] K. Adaxial epidermal cells of costa, ×320. L. Abaxial epidermal cells of costa, ×320. M-O. Cross-sections of leaf, ×250. P. Capsule, ×25. Q. Annulus and exothecial cells near orifice, ×250. R. Exothecial cells from middle part of urn, ×250. S. Stoma, ×250. T. Cross-section of capsule wall, ×250. U. Half part of cross-section of seta, ×320. Drawn from Deguchi-30548.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thus developing a distinct V-shaped boundary between chlorophyllose cell-area and hyaline cell-area. Dioicous. Capsules ovate-oblong, gradually narrowed at base, urn 0.7–1 mm long and 0.25–0.3 mm thick when dry; seta 3–3.5 mm long, straight to flexuous when dry, inserted in a bulbous vaginula; peristome teeth lacking; annulus of oblong transparent cells; exothecial cells linear-oblong, with smooth and rather thin walls, suddenly becoming shorter to quadrate at orifice; stomata phaneroporous, few at apophysis; spores 8–10 μm, finely papillose. Operculum and calyptra unknown in Japanese material. (Above description based on Japanese material.)

Voucher specimen for the record: Japan. Shikoku. Pref. Kochi: Mt. Yokogura (Bakadameshi Cliff), Ochi-cho, Takaoka-gun, 750 m alt., on limestone, June 8, 1986, coll. H. Harada, Herb. H. Deguchi-30548 (KOCH).

Exotic specimens examined for comparison: U.S.A. Florida, Dade County, 2 miles south of Dade County line, northwest of Miami, Jan. 26, 1959, coll. L. E. Anderson & H. Crum no. 13338 (NICH). Jamaica. Farm Hill, Oct. 14, 1927, coll. C. R. Orcutt no. 3445 and Nov. 9, 1927, coll. C. R. Orcutt no. 3829 (NICH); Arntully, Nov. 9, 1927, coll. C. R. Orcutt no. 3820 (NICH).

Distribution. Japan (Shikoku), Southern United States (Texas, Georgia, Florida), Mexico, the West Indies (Cuba, Jamaica, Puerto Rico, Bermuda, the Bahamas, Borbados), British Honduras and Brazil.

Since the original description as a species of *Gymnostomum*, this moss has been ascribed to some different genera of the Pottiaceae until Steere (1945) found such a satisfactory taxonomic position in the genus *Luisierella* Thér. & P. Varde. This genus included two species, *L. pusilla* Thér. & P. Valde (type) and *L. stenocarpa* Biz. & Thér., both of which were reduced to the synonyms of *L. barbula* by Steere (1945).

Although this species is morphologically very distinctive among Japanese pottiaceous mosses, *Weisiopsis anomala* Broth. & Par. resembles it in its leaf shape and size. *W. anomala*, however, has smaller laminal cells (6–7 μm wide), with thinner cell-walls, as well as different areolation of leaf-base where transparent, enlarged cells are developed on both sides of costa, and upper quadrate laminal cells descend along margins, thus the boundary of these cell-groups forms a reversed U-shape.

Some variation can be recognized with respect to urn-length and leaf-length. Although the number of specimens examined is limited, they seem to

vary from population to population or even in a single population. In the plants of the Neotropics, the length of urn ranges from 0.7–2 mm long, although Grout (1940) gave exceptionally high values ranging 2–3 mm and the Japanese material has a rather short urn (less than 1 mm).

As to the leaf-length, the Cuban plants have leaves 2–3 mm long, but they are 1.5–2 mm as noted in the literature for the plants from U.S.A. and 1.2–1.5 mm in the Japanese plants. These quantitative differences both in urn- and leaf-length seem to be of little taxonomic importance.

It is known that this species has 16 peristome teeth which are erect, very short, and densely papillose when they are developed, but sometimes they become rudimentary to apparently absent (Crum & Steere 1957, Crum & Anderson 1981). The Japanese plants reported here lacked peristome teeth. Since only sporophytes of the preceding year were available, further observation is needed on sufficient amount of capsules just at maturity.

The sexuality of this species has been variously described, although the type material of *Gymnostomum barbula* Schwaegr. from Cuba was described as dioicous by Schwaegrichen (1826).

This species has been reported to be dioicous in recent literature (Grout 1940, Crum & Anderson 1961, 1981, Crum & Steere 1957), but has been described as monoicous for the type materials of the synonymous species *Tortula melanocarpa* Mitt. from Bermuda and *Luisierella pusilla* Thér. & P. Varde from Brasil (the former was considered as monoicous by Mitten (1876) and the latter as synoicous by P. Varde (1936)). P. Varde (1936) noted for *L. pusilla*, "Il faut remarquer encore l'inflorescence constamment synoïque, ···" and gave an illustration (Fig. 1–14) showing the synoicous condition with the following explanation for his Fig. 1 as "14, vaginule avec une partie de l'inflorescence synoïque," in which were illustrated no leaves intercalating archegonia and antheridia. Although Crum & Anderson (1961) commented on the illustrations that had appeared before then for *L. barbula* and its synonyms, they did not mention the illustrations provided by P. Varde (1936). After examination of a limited number of specimens, I observed both dioicous and monoicous sexual states. In spite of this I have some hesitation to say positively that it is at least partly dioicous, since it may be rhizautoicous, which is very difficult to be demonstrated in field materials. The monoicous state includes two types of sexuality: synoicous and cryptoicous (for terminology, see Deguchi 1978). The

dioicous state is observed in the specimens from Florida (Anderson & Crum 13338) and Japan (Deguchi 30548) and the monoicous state in the Cuban specimens (Orcutt 3445, 3820, 3829). In the plants showing a cryptoicous state, the male branch, which arises beside archegonia, is not always present in all clus-

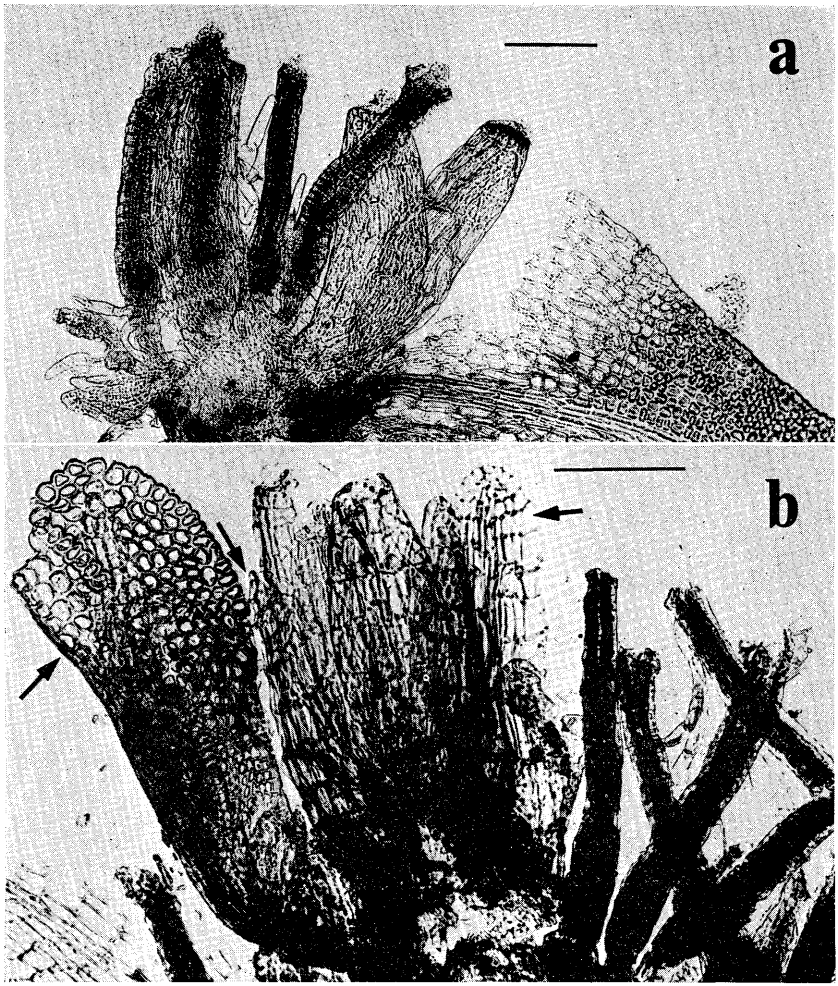

Fig. 2. Synoicous state (a) and cryptoicous state (b) found in *Luisierella barbula*. Arrows in b show perigonial leaves. Bars in a and b both indicate 100 μm. Photographed from Orcutt 3445 for a and 3829 for b.

ters of archegonia. As far as I was able to examine, the cryptoicous condition can be observed often in aged, basal parts of plants (Fig. 2).

The Japanese material was associated with blue-green algae, as was noted by Reese (1984) for the Floridan plants. The blue-green algae are thinly spread on limestone, and coated by calcareous sinter and thus appear whitish; they are filamentous with heterocysts and sheath, and are colonial in matrix. In the limestone outcrop where the present moss grows, the following woody phanerogams dominate: *Carpinus truczaninovii*, *Zabelia integrifolia* and *Spiraea nervosa*.

Luisierella barbula shows a very unique distribution range in the Neotropics and in such a disjunct region as Japan. But, a similar disjunctive distribution has been known for the genus *Iwatsukia* (Cephaloziaceae) in hepatics and for the genera *Mitrastemon* (Rafflesiaceae) and *Glaziocharis* (Burmanniaceae) in phanerogams, although the former two have several outlying areas: South Korea, Eastern Nepal and Mascarene Ridge (Seychelle, Réunion, Mauritius) for the first (Vána 1980), and S.E. Asia for the second (Matsuda 1947).

For the present study I received favours from the following persons, to whom I would like to express my cordial thanks: the director and the curator of Hattori Botanical Laboratory, Nichinan, who kindly arranged the loan specimens; Prof. W.B. Schofield of University of British Columbia, Canada, and Dr. H. Inoue of National Science Museum, Tokyo, who generously checked the English text and gave invaluable advice, especially from a phytogeographical point of view; and Mr. H. Harada, Hiroshima University, who placed his collection at my disposal.

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先年，日本産蘚類のセンボンゴケ科のモノグラフ（Saito 1975）が出されたが，その中に扱われていなかった同じ科の単型属の *Luisierella*（クロコゴケ属，新称）が高知県横倉山の石灰岩壁上に生育することが確認された。筆者の横倉山での蘚類相調査に同行して地衣類を採集していた原田浩氏がお土産として採集してくれた 1 点のコケ標本が，今回の報告のきっかけとなった *Luisierella barbula* (Schwaegr.) Steere（クロコゴケ，新称）であった。この種はこれまでカリブ海のアンチル列島および米国（テキサス，ジョージア，フロリダ州），メキシコ，ベリーズのメキシコ湾岸沿いの地域，バルバドス諸島，ブラジルに分布することが知られていたもので，日本での発見は意外であった。植物体は小型で，1-1.5 mm の長さの舌状の葉をもち，その先端は丸くなっていて，葉基部には透明，薄膜の細胞群があり，その一部は葉縁に沿ってせりあがり，緑色の細胞群の中に陥入して，その境はＶ字型になっている。葉細胞は腹面側に膨出し，背面は平坦になっている。既知の日本産のセンボンゴケ科の種では葉形や腹面側への葉細胞の膨出といった点でホソコゴケモドキ *Weisiopsis anomala* に似ているが，その葉基部の透明細胞群は葉縁に沿ってではなく，中肋に沿ってせりあがり，緑色細胞群と透明細胞群の境界は逆Ｕ字型となる。さらにホソコゴケモドキの葉の中～上部の細胞はクロコゴケよりずっと小さく，しかも薄膜である。

これまで本種の雌雄性については雌雄同株あるいは最近では雌雄異株として記載されてきたが，今回調べた標本（僅か 4 点であるが）では，フロリダ産および日本産のもので，恐らく雌雄異株であり（rhizautoicous であるかもしれず，野外からの標本でこれ

を確かめることは不可能である)，キューバ産のものに雌雄同株の雌雄共立同株 synoicous と隠蔽同株 cryptoicous の2つの型のあることを認めた。

今回報告したクロコゴケと類似の分布型をもつものとして苔類ではイイシバコハネゴケ属が，被子植物ではタヌキノショクダイやヤッコソウが知られている。

本研究の一部は昭和61年度文部省教育研究学内特別経費(高知大学)によった。

○ヒマラヤドクウツギは食用植物（金井弘夫） Hiroo KANAI: *Coriaria nepalensis*, an edible plant

ネパール政府薬草局から Wild edible plants of Nepal (Department of Medicinal Plants. 285pp. 1982. Thapathali, Kathmandu. US $ 10) という本が出版されている。B5 よりやや大きい版で，偶数頁に植物の線画，対面頁には植物名，簡単な記相文，用途，花・果期，薬草局所蔵標本の産地が記されている。その84-85頁に *Coriaria nepalensis* がのっている。現地名は Machino といい，“The ripe fruits are eaten.” と記されている。食用植物図譜にのるほどだから，毒性は問題にならないらしい。そこであらためて Tanaka, C. (1976): Tanaka's cyclopedia of edible plants of the world をみると，*Coriaria nepalensis*（インド・ネパール・ビルマ・中国），*C. terminalis*（シッキム・チベット・中国），*C. sarmentosa*（ニュージーランド），*C. ruscifolia*（ペルー・チリ）がのっていた。

1983年8月に中部ネパール・アンナプルナ山群の北側の Marshandi 渓谷 Chame 付近で，現地の人がこの果実を食べるのをみた。キイチゴを食べるのと全く同様で，黒熟した果実全体を口中にほうり込み，のみ下してしまう。毒ではないが噛んではいけないそうだ。醱酵させてワインにも造るともいう。ただ，ネパール人の「噛まなければ」という言葉には，この植物になんらかの毒性があることを示すほか，微妙な民族習慣の差がひそんでいるように思う。むこうの人達は食べるとき「よく噛む」，つまり歯の咬合面をよくすりあわせるということをしないのではなかろうか？ネパールの米には石英砂が混入していて，我々は歯を傷めることがよくある。ところが同じ飯を食べている同行のネパール人にはこういうことがほとんど起こらないうえ，食べかたが非常に速い。彼等は飯粒をほぐして唾液と混ぜあわせることはしても，我々のように口中で十分噛みつぶしてのみ下すということはせず，その仕事は胃にまかせているのではあるまいか？

日本のドクウツギ *C. japonica* では有毒成分は瘦果に含まれているので，これを吐き出しておけば食べても差支えないことを，冨樫誠氏が大勢の面前で実演してみせたことがあるそうだ。日本のものも噛みつぶしさえしなければ，のみ込んでもかまわないのだろうか？もっともドクウツギの瘦果が噛みつぶされないで消化管に入ったとき，毒性が